



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Rosalie A. Centeno
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In the Application of Edwin Becker et al

Ser.No.: 10/737,243

Filed: December 16, 2003

For: METHOD AND APPARATUS FOR MONITORING THE QUALITY OF LUBRICANT

Commissioner of Patents

Alexandria, Virginia 22313-1450

INFORMATION DISCLOSURE STATEMENT

In accordance with 37 CFR § 1.56, Applicant wishes to call the attention of the Examiner to the following references:

- 1) US 5,719,392
- 2) US 6,175,111
- 3) DE 39 31 497
- 4) DE 41 26 927
- 5) US 6,032,100
- 6) EP 0 672 243
- 7) DE 199 33 924
- 8) WO 95/00833
- 9) DE 39 04 142
- 10) DE 196 50 397
- 11) XP-002253739, Levermore Article

- 12) US 6,421,588
- 13) WO 98/53296
- 14) WO 96/18893
- 15) US 6,225,623
- 16) WO 01/73816
- 17) XP-002253740, Article, Thomas Fruh
- 18) XP-002253741, Article, Dipl.-Ing. F. Plenert
- 19) DE 195 15 270

Reference 1, US 5,719,392 (which is the equivalent of DE 195 15 270), is in the English language and therefore does not require further discussion as to its relevance. In accordance with United States Patent and Trademark practice, it is not necessary to enclose copies of the U.S. Patents.

Reference 2, US 6,175,111 (which is the equivalent of DE 198 40 763), is also in the English language and therefore also does not require further discussion as to its relevance. In accordance with United States Patent and Trademark practice, it is not necessary to enclose copies of the U.S. Patents.

Reference 3, DE 39 31 497, discloses an arrangement that has a sensor head with electronic evaluation for detecting particles of different specific wt. from the fluid. The fluid passing through the sensor head is converted into a rotary flow. The particles are forced into zones within the head for measurement by virtue of their different specific weight and the action of their forces and accelerations. USE - For detecting particles of metal or air or water bubbles in fluid, esp. lubricant, for reliable estimation of damage in lubricated system.

Reference 4, DE 41 26 927, discloses an oil state monitoring arrangement for moving machines which contains a sensor that detects the oil (Sch) changing from the neutral to an acidic state during use. The sensor and a temperature compensation device are connected to an evaluation circuit with a warning element. The sensor has a resistive sensor element (SE) consisting of an easily oxidized metal wire and is integrated into a component on the machine (M) for purging the oil. The temperature compensation arrangement contains a temperature sensor and an electronic comparison element in the evaluation circuit. USE/ADVANTAGE - Especially for monitoring the state of lubricating oil in the internal combustion engine with a basic resistance in the unused state achieved with an additive. The arrangement enables the operator of the machine to detect a critical change in the state of the lubricating oil.

Reference 5, US 6,032,100 is in the English language and therefore does not require any further discussion as to its relevance. In accordance with United States Patent and Trademark practice, it is not necessary to enclose copies of the U.S. Patents.

Reference 6, EP 0 672 243 (Equivalent to DE 693 28 259) is in the English language and therefore does not require further discussion as to its relevance. In accordance with United States Patent and Trademark practice, it is not necessary to enclose copies of the U.S. Patents.

Reference 7, DE 199 33 924, discloses a micro-system that has one or more sensors of physical parameters directly or indirectly related to the operating state of each machine, etc., or of those for which state monitoring is considered necessary, components for measurement signal processing in accordance with the implemented algorithms and components for storing measurement data and/or data derived by algorithms. The system

stores measurement and/or diagnostic signals with time information locally, preferably compressed and/or reduced, to enable reconstruction of a state change against time.

Reference 8, WO 95/00833 (equivalent of DE 43 20 943) is in the English language and therefore needs no further discussion as to its relevance. In accordance with United States Patent and Trademark practice, it is not necessary to enclose copies of the U.S. Patents.

Reference 9, DE 39 04 142, discloses a method for the on-line monitoring of motor oils, in which biosensors are used as indicators of changes in the motor-oil properties.

Reference 10, DE 196 50 397, discloses that determining the degree of wear of oil comprises using absorption and transmission of infra-red radiation in the region around 10.3 μm .

Reference 11 – 15 are all in the English language and therefore need no further discussion as to their relevance. In accordance with United States Patent and Trademark practice, it is not necessary to enclose copies of the U.S. Patents.

References 16, WO 01/73816, discloses an invention that relates to a method and a device for detecting compounds in a gas stream, enabling a plurality of compounds in the analysis gas to be characterized almost simultaneously. The gas stream containing the compounds is guided into the ionization chamber of a mass spectrometer and exposed to radiation with a UV laser pulse. The resulting ions are detected in the mass spectrometer. The gas stream is exposed to said radiation with said UV laser pulses at regular or irregular intervals by alternate exposure to a vacuum ultraviolet (VUV) laser pulse in the ionization chamber, the resulting ions being detected in the mass spectrometer.

Reference 17, XP-002253740, article by Thomas Früh, discloses an electronic “nose”

that can "smell" gases that occur as oils age, reliably indicating when the oil in machines should be changed. This reduces maintenance and material costs and also reduces equipment down times. The electronic nose is based on an oscillating quartz crystal with a thin coating that binds gases that escape from the aging oil. Tiny deposits of material reduce the clock frequency of the oscillating quartz. A total of six oscillating quartzes are each individually coated and each react to different materials.

Reference 18, is in the English language and therefore also does not need further discussion as to its relevance. In accordance with United States Patent and Trademark practice, it is not necessary to enclose copies of the U.S. Patents.

Reference 19, DE 195 15 270, discloses a method for measuring the mobility spectra of ions with ion mobility spectrometers (IMS). The method consists of impressing upon the essentially continuous ion flow of an IMS ion source, which comprises various ion types with various mobilities, a temporal switching signature with an ion admission of approximately 50% by using a very fast ion flow switch, whereby the signatures for the various ion types are displaced toward each other in different manners during the operating time due to the different velocities. From the quasi-continuously received ion current signal at the end of the path of the ion mobility spectrometer the composition of the ion types can be recovered according to mobility and intensity by decoding the switching signature. At the same time an improvement in resolution can be achieved by deconvolution of the diffusion profile. The method has a high duty cycle for the substance admitted and for the ions of ion flow.

Copies of the listed documents are submitted herewith along with the form PTO-1449.

It is respectfully requested that any fees required and not enclosed herewith or any shortages in any fees be charged to Deposit Account 02-1653.

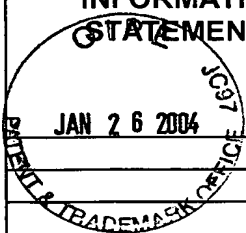
Consideration of the foregoing in relation to this application is respectfully requested.

Respectfully submitted,

A handwritten signature in cursive script that reads "Robert W. Becker". The signature is fluid and extends to the right.

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Enclosures

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| INFORMATION DISCLOSURE STATEMENT BY APPLICANT  | Complete if Known | |
| | Application Number | 10/737,243 |
| | Filing Date | December 16, 2003 |
| | First Named Inventor | Edwin Becker et al |
| | Group Art Unit | |
| | Examiner Name | |
| | Attorney Docket No. | 2646CONT US |

| U. S. PATENT DOCUMENTS | | | | | | | |
|------------------------|----------|---------------------------|----------------------|---------------|-------|----------|-------------|
| Examiner Initials | Cite No. | Patent Number Pub. Number | Issue Date Pub. Date | Patentee | Class | Subclass | Filing Date |
| | 1 | 5,719,392 | 2/17/1998 | Frantzen | | | 4/24/1996 |
| | 2 | 6,175,111 | 1/16/2001 | Sorita et al | | | 7/30/1998 |
| | 5 | 6,032,100 | 2/29/2000 | Forfitt et al | | | 6/12/1996 |
| | 12 | 6,421,588 | 7/16/2002 | Janata | | | 8/14/2000 |
| | 15 | 6,225,623 | 5/1/2001 | Turner et al | | | 7/30/1998 |

| FOREIGN PATENT DOCUMENTS | | | | | | | |
|--------------------------|----------|-----------------|------------------|--------------------------|-------|----------|-------------|
| Examiner Initials | Cite No. | Document Number | Publication Date | Country or Patent Office | Class | Subclass | Translation |
| | | | | | | | Yes No |
| | 3 | DE 39 31 497 | 18 Apr 1991 | Germany | | | X |
| | 4 | DE 41 26 927 | 13 Aug 1992 | Germany | | | X |
| | 6 | EP 0 672 243 | 29 Mar 2000 | Europe | | | X |
| | 7 | DE 199 33 924 | 02 Nov 2000 | Germany | | | X |
| | 8 | WO 95/00833 | 5 Jan 1995 | WIPO | | | X |
| | 9 | DE 39 04 142 | 23 Aug 1990 | Germany | | | X |
| | 10 | DE 196 50 397 | 10 Jun 1998 | Germany | | | X |
| | 13 | WO 98/53296 | 26 Nov 1998 | WIPO | | | X |
| | 14 | WO 96/18893 | 20 Jun 1996 | WIPO | | | X |
| | 16 | WO 01/73816 | 26 Jan 2001 | WIPO | | | X |
| | 19 | DE 19515270 | 07 Nov 1996 | Germany | | | X |

| OTHER PRIOR ART & NON PATENT LITERATURE DOCUMENTS | | |
|---|----------|--|
| Examiner Initials | Cite No. | |
| | 11 | XP-002253739, Article by Dianne M. Levermore |
| | 17 | XP-002253740, Article by Thomas Fruh |
| | 18 | XP-002253741, Article by Dipl.-Ing. F. Plenert |
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| Examiner | | Date | |
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1/23/2004